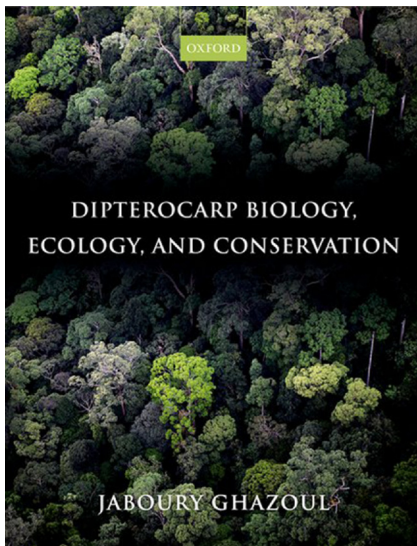


Book Review

Dipterocarps: The Amazing Asian Tree Family

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Drop a group of ecologists into a rainforest in Malaysia or Indonesia and they might see a magnificent stand of unbranched trees 60 m or more in height. Structurally, it would look like the finest tropical forests in other parts of the world. But most in the group would be stunned to realize that more than half of the large trees they see are dipterocarps and that dipterocarps account for the overwhelming majority of the tree biomass in this forest. Tropical forests are known for their hyperdiversity, but the tropical forests of Southeast Asia are unique – they are dominated by trees from one species-rich family: the Dipterocarpaceae.

Dipterocarps (meaning ‘two-winged fruits’) have an outsized influence on the ecology and economy of Southeast Asian forests. They deserve the thorough

treatment that Jaboury Ghazoul gives them in his new book *Dipterocarp Biology, Ecology, and Conservation*. Ecologists who have just discovered the wonder of dipterocarps, those driven to know everything about this amazing family, and those working in dipterocarp forests will enjoy and appreciate the book’s detailed accounts of the specialized biology of this family. Ecologists looking for a more general overview of the biology of Asian forests would be better off reading books covering the tropical forests of East and Southeast Asia [1–4], including one by the same author [5].

In this book, Ghazoul addresses the major topics of dipterocarp biology (e.g., distribution, evolution, reproduction, light acquisition, water relations, nutrients) in successive chapters, largely following the basic principles and approaches of forest ecology research. The twist, of course, is that the dipterocarp family and the forests they inhabit are not typical; the family is incredibly diverse and the forests have many unusual features.

The chapter on evolution and biogeography, for example, reviews the evidence on the phylogeny and evolutionary history of the family. Ghazoul concludes that the dipterocarp family is likely to have originated in Africa when it was part of Gondwanaland; the family then migrated to Asia via India and achieved its current ecological dominance and diversity through a spectacular evolutionary radiation in Southeast Asia. The chapter on reproduction examines one of the most unusual aspects of dipterocarp forests: mast flowering and fruiting events occur roughly once every 6 years. In most years, dipterocarp forests provide little food for insects, birds, mammals, or other animals. In mast years, huge numbers of flowers and fruits appear, seeds disperse, and seedlings carpet the forest floor. The impacts of this boom–bust cycle on animal life and ecosystem processes are profound and unlike forests elsewhere.

The chapter on community ecology presents considerable new and novel information on species relationships, particularly mycorrhizal associations and herbivory by insects on leaves and seeds. Among other details this chapter reinforces the ability of dipterocarps to avoid providing food for animals despite the trees’ abundance. In addition to their masting behavior, they produce resins that keep herbivory low. The author misses the opportunity, however, to describe how the biology of dipterocarps affects the ecology and evolution of birds, mammals, and other animal species in these forests.

In the final chapter, the author considers the loss of dipterocarp forests to unregulated logging and conversion to plantation crops, such as oil palm, and the prospects for protecting and restoring them. The chapter describes promising conservation strategies but could have benefitted from a more detailed presentation of current logging practices and the importance of dipterocarps in the global timber industry. Part of the value of timber from Southeast Asia is that most comes from dipterocarps; it is light and easily worked and can be sold in large volumes under just a few wood types. One of the great tragedies of the Asian timber industry is that dipterocarp forests are amenable to selective harvesting and long-term management, but economic and political conditions favor short-term intensive harvesting and conversion to plantations.

Overall the book is well written, thoroughly researched, and packed with information on this important tropical tree family. The black-and-white figures can be tough to interpret and the author misses opportunities to make some key synthetic points. But there is a lot to like, including the thoroughness of the review and suggestions of promising directions for further research. I thought the author’s approach was valuable and worthy of replication; I think similar books should be written on other large families of trees, such as

legumes and oaks. This book is a valuable contribution to the tropical ecology literature.

Dipterocarp Biology, Ecology, and Conservation by Jaboury Ghazoul, Oxford University Press, 2016. US \$89.95, hbk (320 pp.) ISBN 978-0-199-63965-6.

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